

Responsiveness Summary

Mid-Kansas Electric Company, LLC.  
Rubart Station  
Grant County, Kansas

Prevention of Significant Deterioration Permit



Kansas Department of Health and Environment

Bureau of Air

Air Permitting Section

January 28, 2013

## **I. KDHE Decision**

The Kansas Department of Health and Environment (KDHE) Bureau of Air (BOA) has made the decision to issue an Air Quality Construction Permit to Mid-Kansas Electric Company, LLC, (Mid-Kansas) for construction of a new electric power generating facility to be located in Grant County, Kansas.

The construction permit issued for the project identifies the applicable rules governing emissions from the facility, and establishes enforceable limitations on its emissions. The permit also establishes appropriate compliance procedures, including requirements for emissions testing, monitoring, recordkeeping and reporting. Mid-Kansas will be required to carry out these procedures on an ongoing basis to demonstrate that the facility is operating within the limitations established by the permits and that emissions are being properly controlled.

The permit related documents can be found at the KDHE BOA website address:

<http://www.kdheks.gov/bar/midkanec/midkanec.html>

## **II. Project Description**

On July 9, 2013, the KDHE BOA received an application from Mid-Kansas requesting a permit for a new electric power generating facility. The application included 24 new spark ignition Caterpillar four stroke lean burn reciprocating internal combustion engine electricity generating units (EGUs) using pipeline quality natural gas at a new green field site. Each EGU will be nominally rated at 10 megawatts (MW) of electricity for a combined power output of approximately 240 MW. The facility will also include two 450 kilowatt (kW) pipeline quality natural gas fired emergency generators, a 190 HP diesel fueled emergency fire pump, a two million British thermal units/hr (mmBtu/hr) natural gas fired indirect fuel gas heater, and circuit breakers and switchers. Sunflower Electric Power Corporation (Sunflower), on behalf of Mid-Kansas, will operate the generating units and the ancillary facilities and auxiliary equipment that will support the EGUs to be constructed under the permit.

## **III. KDHE Permit Considerations**

The project proposed by Mid-Kansas is considered construction of a major stationary source because one or more of the Prevention of Significant Deterioration (PSD) regulated air pollutants from the proposed activity exceeds the major source thresholds. Therefore, KDHE permit considerations must follow the PSD Air Quality Construction Permit requirements.

PSD does not prevent sources from increasing emissions. PSD is designed to:

- protect public health;
- preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monument, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value;
- insure that economic growth will occur in a manner consistent with the preservation of existing clean air resources; and
- assure that any decision to permit increased air pollution in any area to which this section applies is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decision making process.

PSD applies to new major sources or major modifications at existing sources for pollutants where the area the source is located is in attainment or unclassifiable with the National Ambient Air Quality Standards (NAAQS). It requires the following:

- installation of the “Best Available Control Technology” (BACT);
- an air quality analysis;
- an additional impacts analysis; and
- public involvement.

**A. Best Available Control Technology (BACT)**

BACT is an emissions limitation which is based on the maximum degree of control that can be achieved. It is a case-by-case decision that considers energy, environmental, and economic impacts. BACT can be add-on control equipment or modification of the production processes or methods. This includes fuel cleaning or treatment and innovative fuel combustion techniques. BACT may be a design, equipment, work practice or operation standard if imposition of an emissions standard is infeasible.

BACT applies to each new or modified affected emissions unit and pollutant emitting activity at the source for each pollutant having a potential to emit, or an increase in potential to emit, above the PSD significance level(s). The proposed Mid-Kansas facility is a new major stationary source for at least one regulated pollutant (CO<sub>2</sub>e, NO<sub>x</sub>, CO, and

VOC) and is subject to the requirements of 40 CFR 52.21 as adopted under K.A.R. 28-19-350. Pursuant to 40 CFR 52.21, since NO<sub>x</sub> and VOC emissions for the proposed project exceed major source thresholds, emissions for ozone (O<sub>3</sub>) are also considered significant. NO<sub>x</sub> and VOC are considered surrogates for O<sub>3</sub>, therefore NO<sub>x</sub> and VOC controls will be deemed controls for O<sub>3</sub>.

For the Mid-Kansas facility, BACT is listed in the PSD Permit Summary, Section V.

## **B. Ambient Air Quality Analysis**

The proposed facility is a major source as defined by K.A.R. 28-19-350, Prevention of Significant Deterioration and the facility must demonstrate that allowable emission increases from the proposed facility would not cause or contribute to air pollution in violation of:

1. any NAAQS in any air quality control region; or
2. any applicable maximum allowable increase over the baseline concentration in any area (increment).

This demonstration was made and is presented in the PSD Permit Summary, Section VI.

## **C. Additional Impact Analysis**

In accordance with 40 CFR 52.21(o)(1), the owner shall provide an analysis of the impairment to visibility, soils and vegetation that would occur as a result of this project and to what extent the emissions from the proposed modification impacts the general commercial, residential, industrial and other growth. This analysis is presented in the PSD Permit Summary, Section VI.

## **D. Public Involvement**

Following the initial application review, the KDHE BOA made a preliminary determination that the application met the standards for issuance of a construction permit and prepared a draft permit for public review and comment.

The draft permits were available for public review from December 20, 2012 through January 22, 2013. No requests were made for a public hearing, therefore, no public hearing was conducted.

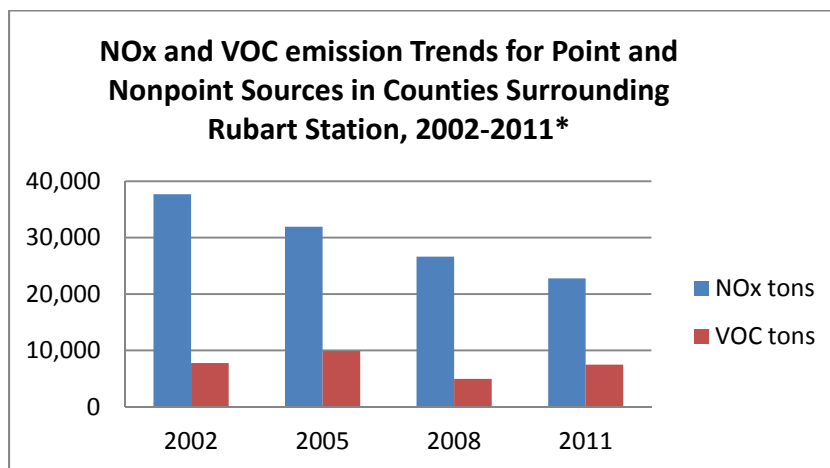
KDHE received written comments from the U.S. Environmental Protection Agency (EPA) Region 7 in a letter dated January 17, 2013. Section IV of this document includes the KDHE responses to EPA. KDHE received written comments from Mid-Kansas Electric Company, LLC. in a letter dated January 22, 2013. Section V of this document includes the KDHE responses to Mid-Kansas.

#### IV. Response to EPA Region 7

- A. The Permit Summary correctly states that since volatile organic compound (VOC) and nitrogen oxides (NO<sub>x</sub>) emissions for the proposed project are significant that emissions for ozone are also considered significant. Table 1 in the Air Quality Impact Analysis Review also states that ozone exceeds the significant emission rate from NO<sub>x</sub> and VOC. We were not able to find any information in the permit record on KDHE assessment whether or not the project would result in violations of the ozone National Ambient Air Quality Standards (NAAQS).

*KDHE Response:*

*KDHE has reviewed the ozone NAAQS data for the area, as well as the NO<sub>x</sub> and VOC emission trends for counties surrounding Rubart Station. The area is currently meeting the ozone NAAQS. The declining NO<sub>x</sub> emissions in the area, combined with expected emissions from the facility, are not expected to contribute to changes in Grant County attainment.*



*\*Data obtained from KDHE emissions inventory.*

- B. The draft permit has greenhouse gas best available control technology limits (BACT) of 10,692 lb/hour of carbon dioxide equivalents (CO<sub>2</sub>e) that applies at all times except during startup and a 10,476 lb/hour CO<sub>2</sub>e

startup limit. Both BACT limits have an annual averaging period. The permit states that compliance with these BACT emission limits is established by performance testing. It seems unlikely that a performance test could be used to demonstrate compliance with an emission limit with an annual average. We suggest changing the averaging period to a shorter period such as a 3-hour averaging period. The permit requires an initial performance test to verify compliance with the electric generating units' (EGU's) greenhouse gas BACT limits. We could not find any requirement to verify compliance with these BACT limits after the initial performance test. We suggest that the permit contain either monitoring or testing that would verify compliance with these BACT limits in the future. This would not necessarily need to be directly monitoring the greenhouse gases such as carbon dioxide (CO<sub>2</sub>) emitted. Since the carbon emitted as carbon dioxide comes from the natural gas burned as fuel for the engines, one suggestion would be to monitor the fuel usage versus the amount of electricity generated by each EGU to assure the engines continue to operate efficiently and consistent with "good combustion practices" selected as BACT. We would suggest that KDHE consider a pound per megawatt hour or a fuel usage per electricity output BACT limit.

*KDHE Response:*

*KDHE has added the following permit condition:*

*The 12-month rolling average CO<sub>2</sub> emissions from the EGUs are limited to no more than 1.25 lb/kWh<sup>1</sup>; the total average EGU emissions for each month is determined as follows:*

$$ER = x * k * y \div z$$

*Where:*

*ER= emission rate of carbon dioxide from the EGUs, g/kW-hr;  
k = 3.667 lb carbon dioxide emitted per pound carbon in the fuel;  
x = lb carbon per cubic foot of natural gas, based on a monthly average fuel analysis by the pipeline supplier,  
y = total monthly cubic feet of natural gas burned in the EGUs; and  
z = total monthly gross kilowatt hours generated by the EGUs.*

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<sup>1</sup> Fuel carbon dioxide is not included in this calculation. Startup fuel and energy produced during startups will not be included in this calculation. Fuel gas heater natural gas consumed is not included in the calculation.

*EPA-457/B-11-001, March 2011, PSD and Title V Permitting Guidance for Greenhouse Gases states that “...since the environmental concern with GHGs is their cumulative impact in the environment, metrics should focus on longer-term averages (e.g., 30- or 365-day rolling average) rather than short term averages (e.g. 3- or 24-hr rolling average).”(p.46) For this reason, KDHE has required the long term averaging period for the greenhouse gas emission limits.*

- C. Please verify that the greenhouse gas BACT limits for the engines in the permit are correct. Both the Permit Summary Sheet and the permit application have lower BACT limits.

*KDHE Response:*

*KDHE has verified the following BACT limits:*

*The BACT limit for CO<sub>2e</sub> at all times except during startup is 10,692 lb/hour.*

*The BACT limit for CO<sub>2e</sub> during startup is 10,476 lb/hour.*

*CO<sub>2</sub> at all times except during startup will be measured during performance testing and will be compared to a limit of 10,683 lb/hour.*

*CO<sub>2</sub> during startup will be measured during performance testing and will be compared to a limit of 10,467 lb/hour.*

*This is consistent with the permit application. KDHE has corrected an error in the DRAFT Permit Summary Sheet.*

## **V. Response to Mid-Kansas Electric Company, LLC.**

- A. Mid-Kansas is currently doing preliminary engineering design for auxiliary systems for Rubart Station. It has come to our attention that certified emergency natural-gas AC generators (NSPS Subpart JJJJ) may not be available in the size (450 kW) that is required for the Project. It appears that the permit requirements for compliance with Subpart JJJJ in the permit presume only a certified engine will be used. In consideration of the vendors' inability to currently provide certified engines, we request the permit conditions be appropriately modified to enable the use of a non-certified engine should that be necessary.

*KDHE Response:*

*The permit has been updated to include provisions for emergency natural gas AC generators that are not certified.*

- B.** Permit Item VI A 2 (page 7) — Remove the phrase “each of the”, insert the word “any”, and strike the “s” in the word “generators” from the first paragraph in this section of the permit to remove ambiguities in the condition as expressed. The sentence should become “The BACT emission of pollutants from each of the any emergency AC generators shall be no greater than limitations specified below, excluding periods of startup, shutdown, and malfunction.”

*KDHE Response:*

*KDHE has revised the sentence to read as follows:*

*The BACT emission of pollutants from any emergency AC generator shall be no greater than limitations specified below, excluding periods of startup, shutdown, and malfunction.*

- C.** Permit item VI B 5 (page 8) — Insert “of”, as shown below in this sentence. The sentence should become “Neither of the emergency AC generators nor the emergency fire pump shall be operated for more than 100 hours per year for testing and maintenance. Emergency use is not limited.”

*KDHE Response:*

*KDHE has made the requested revision.*